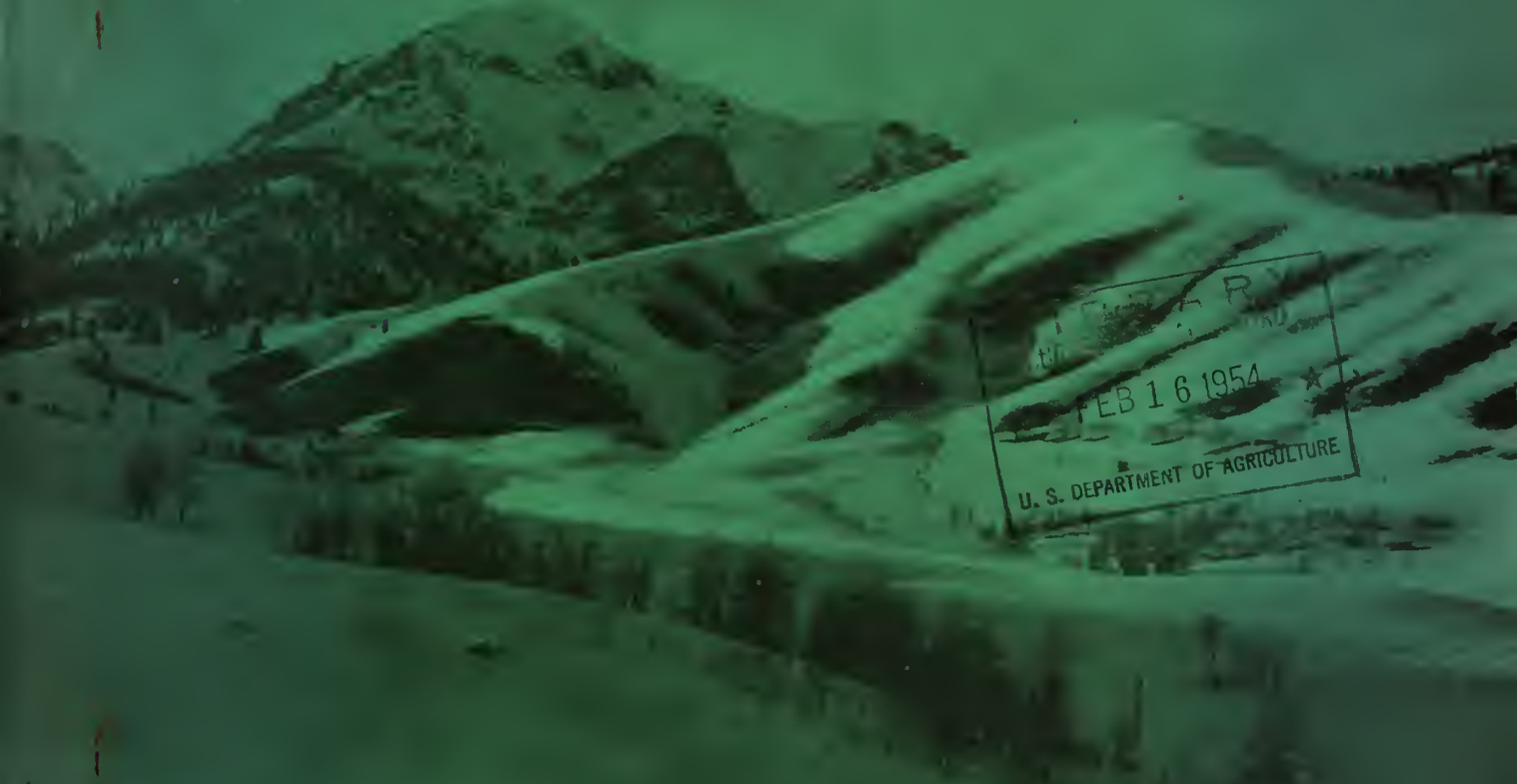
Federal - State Cooperative
Snow Surveys and Water Supply Forecasts
for

Montana and Northern Wyoming
Upper Missouri,
Upper Columbia and
Yellowstone Rivers



DIVISION OF IRRIGATION, SOIL CONSERVATION SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE
AND
MONTANA AGRICULTURAL EXPERIMENT STATION

In cooperation with the U. S. Forest Service, U. S. Geological Survey, National Park Service, U. S. Bureau of Reclamation, State Engineers of Montana and Wyoming and other Federal, State and local organizations.

AS OF
FEB. 1, 1954

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY
AND WATER SUPPLY FORECAST REPORTS:

Forecasts by U. S. Weather Bureau of total annual streamflow October-September, inclusive, at more than 300 gaging stations are issued monthly January through May in the publication WATER SUPPLY FORECASTS FOR THE WESTERN UNITED STATES.

Weather Bureau forecasts of runoff presented in that bulletin are computed from procedures based on mathematical analysis of the relation between precipitation and runoff.

The Weather Bureau bulletins may be secured by writing to:

Hydrologist in Charge
River Forecast Center
U. S. Weather Bureau
712 Federal Office Building
Kansas City 6, Missouri

For current information on local river and flood conditions, reference should be made to the appropriate River District Office, listed below:

Meteorologist in Charge Weather Bureau Office Box 1705 Helena, Mont.	Missouri River and tributaries above Fort Peck Dam; Milk River
Meteorologist in Charge Weather Bureau Airport Station Box 1338 Billings, Mont.	Yellowstone River and tributaries.
Meteorologist in Charge Weather Bureau Airport Station R.F.D. #1 Spokane, Washington	Columbia River and tributaries above and including Grand Coulee Dam.

State of Montana

FEDERAL--STATE COOPERATIVE SNOW SURVEYS

AND

IRRIGATION WATER FORECASTS

FOR

MONTANA AND NORTHERN WYOMING,

Upper Missouri and Upper Columbia River Basins

Report Prepared
by

Ashton R. Codd: Hydraulic Engineer
Soil Conservation Service

and

O. W. Monson: Irrigation Engineer
Montana Agricultural Experiment Station

Soil Conservation Service

and

Montana Agricultural Experiment Station
Bozeman, Montana

IRRIGATION WATER SUPPLY OUTLOOK
FOR SEASON 1954
AS OF FEBRUARY 1, 1954

The irrigation water supply for 1954 from snow-pack, as it appears on February 1, is above average this year. Snow Surveys made at several key stations in the Upper Missouri River Basin, on or about February 1, indicate a FAIR water supply for the Upper Missouri Basin; about 10% more than last season on February 1.

The snow-pack over the Columbia Basin is excellent for February 1. The Flathead Basin is averaging about 140% average and the Clark Fork Basin about 125% average. Most stations indicate approximately 10% to 15% more snow water than last season.

Irrigation Reservoirs are near average volumes for February. Stream-flow receded sharply under the influence of cold weather during mid-January, resulting in below average flow for the month in nearly all sections of the state.

Valley precipitation for January was considerably above average at all stations over the Columbia River Basin, and near or above average at most stations in the Upper Missouri Basin in Montana, with the exception of the Upper Beaverhead and stream. Although the prospects for another large snow water year is apparent at this time, changing conditions during the months of February and March could well alter the excellent indications that exist from these surveys.

MONTANA SNOW SURVEYS - FEBRUARY 1, 1954

MISSOURI BASIN DRAINAGE BASIN AND SNOW COURSE **	No.	Elev	SNOW COVER MEASUREMENTS 1954 Date of Survey	Snow Depth (In.)	Water Content (In.)	Past Record Water Content (In.) 1953	1952	Avg.	% Avg.	Years Record
JEFFERSON RIVER										
(Rock-Beaverhead)										
*Camp Creek	12E3	6800	1/31	28	6.3	9.6	15.5	6.3	100	19
(Big Hole)										
Gibbons Pass	13D2	7100	2/1	60	19.0	18.6	20.0	14.9	128	15
*Moose Creek	13D16	6200	2/1	47	13.1	15.6	13.9	10.7	123	9
MADISON RIVER										
Hebgen	11E5	6550	2/3	33	8.6	7.3	14.0	8.3	104	20
W.Yellowstone	11E7	6700	2/3	32	8.3	6.8	13.9	7.7	108	17
21-Mile	11E6	7150	2/3	46	13.5	11.2	21.6	11.2	121	17
*Big Springs	11E9	6500	1/27	59	14.1	14.5	24.0	12.9	109	19
*Island Park	11E10	3600	1/30	48	12.4	11.1	19.7	10.1	123	19
*Valley View	11E8	6500	1/28	46	8.2	9.7	19.5	10.1	81	9
Norris Basin	10E2	7500	2/1	30	8.9	6.3	10.6	7.7	115	4
GALLATIN RIVER										
Devil's Slide	10D4	8100	1/30	43	12.3	10.3				2
Hood Meadow	10D3	6600	1/31	23	4.8	3.5				2
New World	10D1	6700	1/26	23	5.1	5.7	9.8	7.6	68	7
21-Mile	11E6	7150	2/3	46	13.5	11.2	21.6	11.2	121	17
MISSOURI RIVER MAIN STEM										
Chessman Res.	12C5	6200	2/1	14	3.6	3.0	4.6	3.2	113	19
Picnic Grounds	13C6	6500	2/1	18	5.1	3.8	4.3	3.3	154	10
Pipestone Pass	12D1	7200	2/1	15	2.1	3.0	3.1	2.9	72	15
Tenmile, Lower	12C2	6250	1/31	23	5.3	4.9	5.8	4.6	115	19
Tenmile, Upper	12C4	8000	1/31	32	8.6	9.0	10.4	8.3	104	20
Marias Pass	13A5	5250	2/2	67	19.7	12.2	16.6	11.6	170	20
UPPER YELLOWSTONE										
Canyon	10E3	7750	2/1	43	11.5	8.9	10.6	10.4	110	9
Cooke City	10D7	7400	2/1	28	8.2	5.7	7.3	6.1	134	8
Lake Camp	10E4	7850	2/1	31	7.4	5.7	9.0	6.3	117	9
Lupine	10E1	7300	2/1	33	7.8	5.3	11.7	6.4	122	13

*Adjacent Basin

MONTANA SNOW SURVEYS - FEBRUARY 1, 1954

MISSOURI BASIN DRAINAGE BASIN AND SNOW COURSE **	No.	Elev.	SNOW COVER MEASUREMENTS 1954 Date of Survey	Snow Depth (In.)	Water Content (In.)	Past Record Water Content (In.) 1953	1952	Avg.	% Avg.	Years Record
LOWER YELLOWSTONE (Wind River - ab. Div. Dam)										
Brooks Lake #3	10F2	9200	1/25	61	15.3	15.6	19.4	17.1	89	14
Burroughs Creek	9F6	8800	1/28	52	11.0	11.5	8.7	13.2	83	6
Du Noir	9F2	8750	1/26	28	5.5	5.2	5.8	6.7	82	13
Geyser Creek	9F3	8500	1/27	27	5.5	4.9	5.3	6.8	81	6
Little Warm	9F4	9500	1/27	49	11.1	10.3	12.4	16.9	66	5
Sheridan	9F1	7500	1/26	27	5.1	6.5	6.0	5.7	89	13
T-Cross Ranch	9F5	8000	1/29	32	6.2	6.5	3.4	5.0	124	14
Dinwoodie	9F10	10000	2/3	30	6.5	7.1	10.1	11.2	58	6
Dry Creek	9F9	9500	2/3	18	3.5	3.1	4.1	5.8	60	6
Hobbs Park	9G2	10000	2/2	45	12.3	8.9	15.8	15.0	82	6
Mosquito Park	9G3	9500	2/2	24	5.3	4.8	4.7	6.7	79	11
St. Lawrence	9F11	9000	1/31	19	3.7	4.1	5.4	5.1	73	11
Trout Creek	9G1	8400	2/2	19	4.2	3.6	3.2	3.8	100	6
POPO AGIE RIVER										
Blue Ridge	8G2	9500	2/1	36	8.8	6.4	12.1	8.0	110	13
Grannier Meadows	8G4	9000	2/1	40	9.7	8.2	13.0	9.5	102	18
*Larsen Creek	9G4	9000								
Sawmill Glade	8G1	8500	2/1	21	4.7	4.2	5.7	5.1	92	13
South Pass	8G3	9000	2/1	41	10.6	8.8	14.3	9.4	113	13
Mulligan Park	9G5	8900								
*Dutch Joe	9C6	8700								
BIG HORN RIVER (Wyo.)										
Beavers Mill	9F8	8000	1/29	21	6.4	5.3	3.2	5.4	118	6
Owl Creek	8F1	8700	1/27	17	5.4	3.2	4.3	4.3	126	6
Wood River	9E7	8000	2/2	16	4.9	2.5				2
SHOSHONE RIVER										
East Entrance	10E6	7000	2/1	35	8.3	6.7	11.0	9.9	84	6
Sylvan Pass	10E5	7100	2/1	40	9.4	5.9	12.2	10.9	86	11

*Adjacent Basin

MONTANA SNOW SURVEYS - FEBRUARY 1, 1954

MISSOURI BASIN DRAINAGE BASIN AND SNOW COURSE **	No.	Elev.	SNOW COVER MEASUREMENTS 1954 Date of Survey	Snow Depth (In.)	Water Content (In.)	Past Record Water Content (In.) 1953-	1952	Avg.	% Avg.	Years	Record
TONGUE RIVER											
Burgess R.S.	7E4	7900	2/2	37	13.4	8.1	9.0	11.2	120		4
Big Goose	7E2	7700	2/1	10	1.9	2.0	2.6	2.5	76		4
Dome Lake	7E5	9000	2/1	25	6.4	3.4	4.6	4.3	148		5
POWDER RIVER											
North Powder	7E8	8500	2/1	21	4.4	3.8	6.8	5.0	88		
Soldier Park	7E6	8700	2/1	13	1.4	1.6	2.5	2.3	61		4
KOOTENAI			**COLUMBIA BASIN**								
New Fernie	Can.	4100	2/1	38	14.3	11.9	12.3	11.5	124		4
Farrow	Can.	4000	1/29	50	11.3						1
Marble Canyon	Can.	5000	1/31	45	12.8	13.5	10.0	11.8	108		7
Nelson Creek	Can.	3050	1/29	60	15.1	13.3	12.9	10.0	151		16
Sinclair Pass	Can.	4500	2/1	28	8.0	3.8	5.3	4.6	173		7
Sullivan Mine	Can.	5100	2/1	48	11.5	10.3	12.7	10.1	104		9
Gray Creek	Can.	5100	1/31	63	18.2	12.4	12.6	12.6	145		6
BITTERROOT											
Gibbons Pass	13D2	7100	2/1	60	19.0	18.6	20.0	14.9	128		15
*Moose Creek	13D16	6200									
FLATHEAD RIVER											
Blue Bird	14A1	6800									
Basin Creek	13B14	5000	1/30	48	12.8	6.4	9.5	7.8	164		4
Desert Mountain	13A2	5600	2/2	52	14.8	9.2	15.2	10.6	140		8
Holbrook	14B13	4530	1/30	47	12.0	7.2	6.4				3
Marias Pass	13A5	5250	2/2	67	19.7	12.2	16.6	11.6	170		20
Twin Creeks	13B11	3580	1/30	48	12.6	8.4	10.9	9.4	131		4

*Adjacent Basin

MONTANA SNOW SURVEYS - FEBRUARY 1, 1954

COLUMBIA BASIN DRAINAGE BASIN AND SNOW COURSE **	No.	Elev.	SNOW COVER MEASUREMENTS 1954 Date of Survey	Snow Depth (In.)	Water Content (In.)	Past Record Water Content (In.) 1953	1952	Avg.	% Avg.	Years of Record
UPPER CLARK FORK										
Coyote Hill	13B11	4200	2/2	34	10.1	8.2	10.4	6.9	146	8
Chessman Res.	12C5	6200	2/2	14	3.6	3.0	4.6	3.2	113	19
Intergaard	13C4	6450	2/1	23	5.9	5.6	6.7	5.2	113	10
Lubrecht For.#6	13C8	5400								
Picnic Grounds	13C6	6500	2/1	18	5.1	3.6	4.3	3.3	154	10
Pipestone Pass	12D1	7200	2/1	15	2.1	3.0	3.1	2.9	72	15
Southern Cross	13C5	6500	2/1	22	6.2	5.1	6.1	3.9	159	10
Storm Lake #2	12C7	7780	1/28	34	8.2	7.8				2
Stuart Mill	13C6	6500	2/1	20	5.4	4.6	5.3	4.4	123	10
Tenmile, Lower	12C2	6250	1/31	23	5.3	4.9	5.8	4.6	115	19
Tenmile, Middle	12C3	6800	1/31	28	7.2	7.6	8.2	6.6	109	20
Tenmile, Upper	12C4	8000	1/31	32	8.6	9.0	10.4	8.3	104	20
*Lookout	15B2	5250	2/3	116	38.4	22.4	32.4	22.1	173	18

*Adjacent Basin

STATUS OF RESERVOIR STORAGE FEBRUARY 1, 1954

RESERVOIR	BASIN & STREAM	USEABLE CAPACITY (M.A.F.)	THOUSAND ACRE FEET IN STORAGE FEBRUARY 1				
			1954	1953	1952	1951	10-yr avg. 1942-51
		MISSOURI RIVER BASIN					
Lima	Beaverhead	84.00	19.7	29.6	35.0	47.5	39.3
Ruby	Ruby Riv	38.85					
Hebgen Lk	Madison Riv	345.00	149.0	178.5	290.8	239.2	231.7
Ennis Lk	Madison Riv	41.00	39.3	38.5	38.9	30.8	34.8
Middle Crk	Hyalite Crk						
Canyon Ferry	Missouri Riv	436.00	434.2	19.0	19.3	23.6	29.3
Hauser Lk (Inc. Lk)	Missouri Riv	62.50	49.3	63.8	36.7	44.1	47.0
Lk Helena	Missouri Riv	10.45	6.0	10.9	2.7	5.2	3.9
Holter Lk	Missouri Riv	81.92	76.3	79.3	63.7	45.7	57.1
Gibson	N.Fk.Sun Riv	105.00	71.6	49.2	68.6	75.4	59.6
Willow Crk	N.Fk.Sun Riv	32.30	25.5	19.9	23.1	23.1	14.0
Pishkun	N.Fk.Sun Riv	32.00	20.7	18.0	23.6	19.0	19.1
Bynum	Teton Riv						
Four Horns	Badgner	19.25	10.3	9.2	8.5		7.8
Swift	Birch Crk	30.00	20.2	8.7	20.9	24.9	21.3
Lk Francis	Dupuyer & Birch Crk	112.00	92.2	95.5	93.4	93.8	88.9
Ackley Lk	Judith Riv	5.82		2.6	3.7	4.9	4.5
Ft. Peck	Missouri Riv	19,000.00	12,010.0	12,420.0	11,590.0	12,440.0	10,258.0
Fresno	Milk Riv	127.20	75.8	76.8	83.4	68.6	51.4
Nelson	Milk Riv	66.80	39.9	31.8	39.9	16.1	30.9
Mystic Lk	W.Rosebud Crk	20.80	11.7	9.1	10.4	11.9	12.2
Cooney	Red Lodge Crk	27.50		13.5	8.6	10.7	7.4
Tongue River	Tongue Riv	73.90	6.3	12.9	17.0	8.2	7.9
Sherburne Lk	Swiftcurrent Crk	66.10		13.9	17.0	23.3	21.8
Hart Butte (N.Dakota)	Hart River	54.8		54.0			New Res. '53
Dickerson (N.Dakota)	Knife River	4.3		3.1			" " "
	YELLOWSTONE RIVER BASIN - WYOMING						
Buffalo Bill	Shoshone Riv	456.60					
Boysen	Wind Riv	819.80					
Pilot Butte	Wind Riv	30.10					
Bull Lk	Bull Creek	155.00					
	COLUMBIA RIVER BASIN						
Georgetown Lk	Flint Crk	31.00	22.8	21.7	24.6	25.2	24.4
Hungry Horse	S.Fk.Flathead	3,500.00	2,327.0	671.1	59.0		
Flathead Lk	Flathead Riv	1,791.00	877.4	961.7	1,182.0	1,107.0	955.2
Ltl Btrroot	L.Bitterroot*	36.10	17.2	28.5	35.7	33.3	14.4
Dry Fork	Dry Fork Crk*	6.70	2.4	3.8	4.1	3.9	1.9
Mission Valley	Flathead Ir.Proj **	98.60	17.0	24.3	43.8	44.1	31.8
Lwr Jock Lk	Jocko Crk	7.6	Snow bound				

* Sum of two reservoirs on Little Bitterroot
* Sum of two reservoirs on Dry Fork Creek
** Sum of (8) eight reservoirs on Project

Federal - State - Private

COOPERATIVE SNOW SURVEYS

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Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"